

## **HIGH STRENGTH PLASTICS MAY REDUCE CRYOGENIC REQUIREMENTS FOR THE NIF\***

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### **ABSTRACT**

Ignition targets for the NIF require thick (80 - 100  $\mu\text{m}$ ) cryogenic fuel layers. The high fill density needed to attain thick fuel layers requires fill pressures in the range of 350 - 400 atm. at room temperatures. Current capsule materials such as CHx will not sustain such high pressures without cryogenic support. In this paper we will show that polyimides have sufficient tensile strength to sustain the required high pressure fills without the need for cryogenic support. We will discuss polyimides advantages over CHx and some fabrication techniques that may be suitable for fabricating capsules. One promising new technique involves the co-evaporation of compatible dianhydrides and diamines to synthesize polyimic acid in a spherical mandrel, followed by heat catalyzed imidization. We will discuss the processes and show some preliminary results.

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\*Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.